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EXAMINER

HIGGINS, GERARD T

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

12/23/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Response to Amendment

1. The amendment filed 10/27/2008 has been entered. Currently, claims 1-13, 15-17, and 19-29 are pending, claims 20-24 are withdrawn, and claim 29 is new.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 29 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With regard to claim 29, the Examiner does not find support for the limitations of this claim. The Examiner does not find support for “a **space** provided between the outer periphery of the optical material layer and an inner periphery of the spacer.” This space is not mentioned in the specification, and the Examiner does not believe that the limitation flows from the drawings.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 1794

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-13, 15-17, 19, and 25-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claims 1, 4, and 5, the phrase "wave-like thickness unevenness" renders the claims indefinite. It has been held that "[t]he addition of the word "type" to an otherwise definite expression (e.g., Friedel-Crafts catalyst) extends the scope of the expression so as to render it indefinite. *Ex parte Copenhagen*, 109 USPQ 118 (Bd. App. 1955); likewise, the phrase "ZSM-5-type aluminosilicate zeolites" was held to be indefinite because it was unclear what "type" was intended to convey *Ex parte Attig*, 7 USPQ2d 1092 (Bd. Pat. App. & Inter. 1986)." Please see MPEP 2173.05(b), and also please note that the word "like" in this instance (i.e. wave-like) has the same meaning as the word "type."

With further regard to claims 1, 4, and 5, the phrase "the organosilicon resin layer is coated on the surface of the optical material layer **after drying**" renders the claims indefinite. It is unclear how something can be coated after it is already dried; further, it is unclear if the organosilicon resin layer is dried at all.

With further regard to claims 1, 4, and 5, the phrase "and corrects the wave-like unevenness to optically uniform" renders the claims indefinite. The phrase is in general narrative and unclear, and therefore renders the claims indefinite.

Claim Rejections - 35 USC § 103

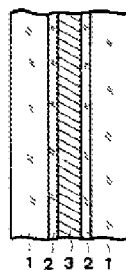
6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 6-8, 11, 15, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinaga et al. (JP 01-231082) in view of Otaki et al. (JP 2002-236439) as evidenced by Travnicek (3,996,187).

With regard to claim 1, Yoshinaga et al. disclose the device of Figure 1.

第 1 図



They disclose an optical component comprised of a holographic film **3**, which is equivalent to applicants' optical material layer, an index of refraction matching fluid **2** covering the holographic film, which may be silicone oil (an organosilicon resin layer), and then a substrate **1** and solid component **1**, which are both glass substrates;

however, they do not specifically set forth the materials of the holographic recording layer.

Otaki et al. teach a volume holographic recording medium. The recording layer is comprised of an organic-inorganic hybrid polymer of general formula (1), which is formed by hydrolysis polycondensation [0029]. The solution is then applied to a base material film, which is equivalent to applicants' substrate [0059] to [0060], and dried to form the optical material layer [0063].

Since Otaki et al. and Yoshinaga et al. are both drawn to volume type holographic materials; it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the known holographic recording materials of Otaki et al. as the recording layer **3** of Yoshinaga et al. The results of which would have been completely predictable to one having ordinary skill in the art of holography; furthermore, one of ordinary skill would understand that an index of refraction liquid of silicone oil would be completely appropriate for the inorganic-organic hybrid recording materials of Otaki et al. as they have similar structural characteristics, and would therefore intrinsically have similar indices of refraction. This is further evidenced in Travnicek, which states that various silicone oils are known to have refractive indices of 1.43 to 1.49 (col. 2, line 55 to col. 3, line 9). The motivation for this combination can be seen at [0083] of Otaki et al., where they state that the materials of their invention have good performance with respect to sensibility and transparency, but also have toughness and thermal resistance.

With regard to the limitation that the optical material layer has a “wave-like thickness unevenness and the organosilicon resin layer is coated on the surface of the optical material layer after drying and corrects the wave-like unevenness to optically uniform,” given the fact that Yoshinaga et al. in view of Otaki et al. disclose the same materials that comprise applicants' optical material layer, and also given the fact that the references make the optical material layer in the same manner as applicants (i.e. coating on a substrate followed by drying); the Examiner deems the optical material layer of Yoshinaga et al. in view of Otaki et al. will intrinsically display wave-like unevenness as claimed. Additionally, the fact that index of refraction matching fluid is present is to correct the wave-like unevenness to optically uniform is an intended use limitation. Intended use limitations are not dispositive of patentability; however, given the fact that Yoshinaga et al. in view of Otaki et al. disclose an optical material layer and the method of making said optical material layer as claimed, and also given the fact that they disclose an organosilicon resin layer as claimed; it is clear to the Examiner that the organosilicon resin layer will perform applicants' intended use.

With regard to claims 6, 8, 11, and 15, the silicone oils of Yoshinaga et al. will intrinsically have an index of refraction that is approximately equal to or within 0.05 of the index of refraction of the inorganic-organic hybrid materials, [0046] and Travnicek values. The silicone oils are chosen to be an index of refraction matching layer, and therefore they will intrinsically satisfy the limitations of the abovementioned claims because when the optical material layer is comprised of more than one material the effective index of refraction will be a weighted average based on the molecular

composition of the optical material layer. The silicone oil is chosen to be approximately the same as the effective/average refractive index of the optical material layer, which therefore means it will intrinsically be within the minimum and maximum indices of refraction; furthermore, it would have been obvious to one having ordinary skill in the art to vary the individual ratios of all the components in the optical material layer to arrive at an appropriate index of refraction that can be matched by an appropriate index of refraction matching layer.

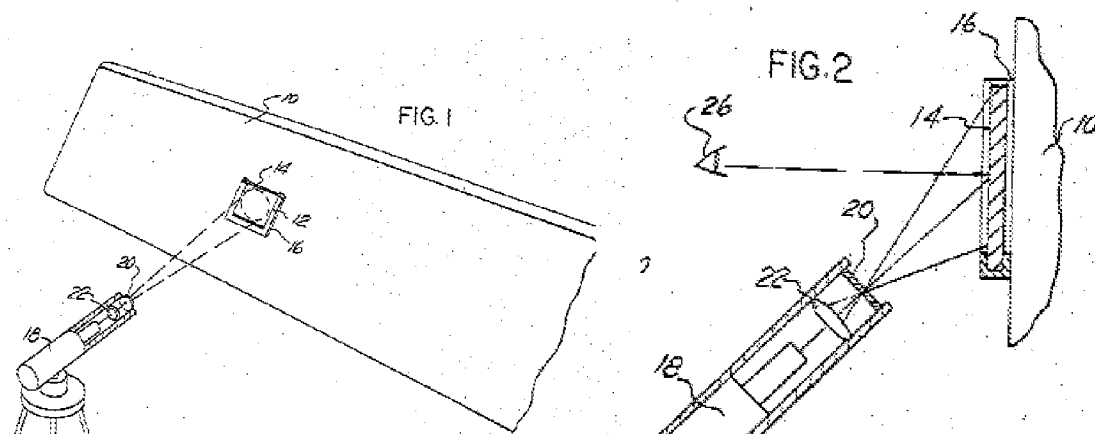
With regard to claim 7, the optical material layer taught by Otaki et al. is comprised of siloxanes [0027].

With regard to claim 19, the glass substrates **1** of Yoshinaga et al. are transparent to allow for recording onto the holographic film.

8. Claims 2 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinaga et al. (JP 01-231082) in view of Otaki et al. (JP 2002-236439) as evidenced by Travnicek (3,996,187) as applied to claims 1 above, and further in view of Penn (3,897,995).

With regard to claim 2, Yoshinaga et al. in view of Otaki et al. as evidenced by Travnicek teach all of the limitations of applicants' claim 1 in section 13 above; however, they fail to teach a spacer layer that surrounds the outer periphery of the optical material layer provided between the substrate and the solid component, the space being formed to have a thickness larger than that of the optical material layer.

Penn teaches the device of Figure 1 and 2.



The holographic recording material has a spacer **16** that is thicker than the optical material layer **14** and separates the substrate **12** and the solid component **10**. It is clear that it is thicker than the optical material layer from the Figure 2, and also from the disclosure at col. 3, lines 52-67. The spacer surrounds the optical material layer on the outer periphery thereof.

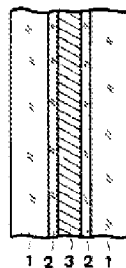
Since Yoshinaga et al. in view of Otaki et al. as evidenced by Travnicek and Penn are all drawn to holographic recording materials, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the spacer units of Penn into the holographic recording plate of Yoshinaga et al. in view of Otaki et al. The results of the combination would have been predictable to one having ordinary skill in the art; further, each of the components would have performed the same in combination as they had separately. The motivation for doing so is to produce a holographic recording plate that had excellent parallelism between the optical recording material and the substrate. The use of spacers is well known in the art of holography; further, it is well-known to provide said spacers in order to establish a space to put the index of refraction matching layer seen in Yoshinaga et al.

With regard to claim 29, there must necessarily be a space present, no matter how minuscule, in between the outer periphery of the optical material layer and an inner periphery of the spacer. If there was no space present the spacer and the optical material would necessarily be connected.

9. Claims 4, 9, 12, 16, 25, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinaga et al. (JP 01-231082) in view of Otaki et al. (JP 2002-236439) and Penn (3,897,995) as evidenced by Travnicek (3,996,187).

With regard to claim 4, Yoshinaga et al. disclose the device of Figure 1.

第 1 図



They disclose an optical component comprised of a holographic film **3**, which is equivalent to applicants' optical material layer, an index of refraction matching fluid **2** covering the holographic film, which may be silicone oil (an organosilicon resin layer), and then a substrate **1** and solid component **1**, which are both glass substrates; however, they do not specifically set forth the materials of the holographic recording layer and they fail to teach a spacer layer that surrounds the outer periphery of the

Art Unit: 1794

optical material layer provided between the substrate and the solid component, the space being formed to have a thickness larger than that of the optical material layer.

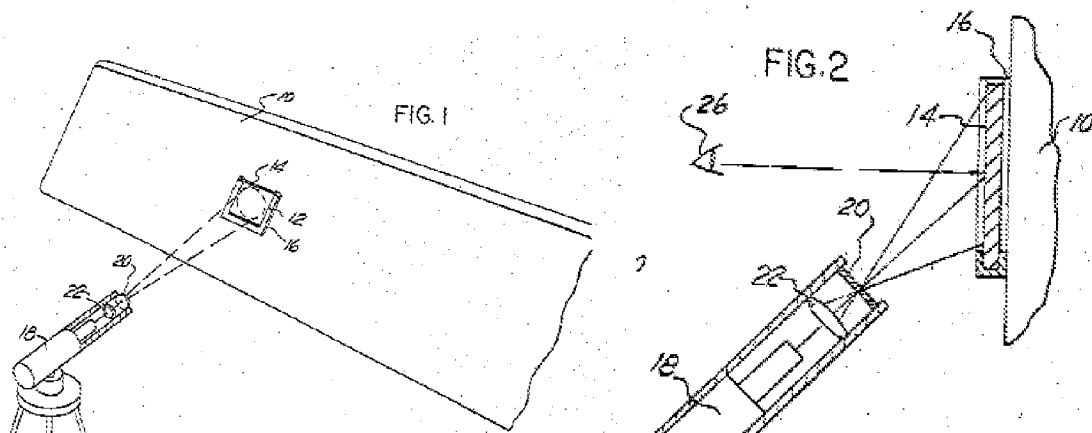
Otaki et al. teach a volume holographic recording medium. The recording layer is comprised of an organic-inorganic hybrid polymer of general formula (1), which is formed by hydrolysis polycondensation [0029]. The solution is then applied to a base material film, which is equivalent to applicants' substrate [0059] to [0060], and dried to form the optical material layer [0063].

Since Otaki et al. and Yoshinaga et al. are both drawn to volume type holographic materials; it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the known holographic recording materials of Otaki et al. as the recording layer **3** of Yoshinaga et al. The results of which would have been completely predictable to one having ordinary skill in the art of holography; furthermore, one of ordinary skill would understand that an index of refraction liquid of silicone oil would be completely appropriate for the inorganic-organic hybrid recording materials of Otaki et al. as they have similar structural characteristics, and would therefore intrinsically have similar indices of refraction. This is further evidenced in Travnicek, which states that various silicone oils are known to have refractive indices of 1.43 to 1.49 (col. 2, line 55 to col. 3, line 9). The motivation for this combination can be seen at [0083] of Otaki et al., where they state that the materials of their invention have good performance with respect to sensibility and transparency, but also have toughness and thermal resistance.

Art Unit: 1794

With regard to the limitation that the optical material layer has a “wave-like thickness unevenness and the organosilicon resin layer is coated on the surface of the optical material layer after drying and corrects the wave-like unevenness to optically uniform,” given the fact that Yoshinaga et al. in view of Otaki et al. disclose the same materials that comprise applicants' optical material layer, and also given the fact that the references make the optical material layer in the same manner as applicants (i.e. coating on a substrate followed by drying); the Examiner deems the optical material layer of Yoshinaga et al. in view of Otaki et al. will intrinsically display wave-like unevenness as claimed. Additionally, the fact that index of refraction matching fluid is present is to correct the wave-like unevenness to optically uniform is an intended use limitation. Intended use limitations are not dispositive of patentability; however, given the fact that Yoshinaga et al. in view of Otaki et al. disclose an optical material layer and the method of making said optical material layer as claimed, and also given the fact that they disclose an organosilicon resin layer as claimed; it is clear to the Examiner that the organosilicon resin layer will perform applicants' intended use.

Penn teaches the device of Figure 1 and 2.



The holographic recording material has a spacer **16** that is thicker than the optical material layer **14** and separates the substrate **12** and the solid component **10**. It is clear that it is thicker than the optical material layer from the Figure 2, and also from the disclosure at col. 3, lines 52-67. The spacer surrounds the optical material layer on the outer periphery thereof.

Since Yoshinaga et al. and Penn are drawn to holographic recording materials, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the spacer units of Penn into the holographic recording plate of Yoshinaga et al. in view of Otaki et al. The results of the combination would have been predictable to one having ordinary skill in the art; further, each of the components would have performed the same in combination as they had separately. The motivation for doing so is to produce a holographic recording plate that had excellent parallelism between the optical recording material and the substrate. The use of spacers is well known in the art of holography; further, it is well-known to provide said spacers in order to establish a space to put the index of refraction matching layer seen in Yoshinaga et al.

With regard to claims 9, 12, 16, and 25, the silicone oils of Yoshinaga et al. will intrinsically have an index of refraction that is approximately equal to or within 0.05 of the index of refraction of the inorganic-organic hybrid materials, [0046] and Travnicek values. The silicone oils are chosen to be an index of refraction matching layer, and therefore they will intrinsically satisfy the limitations of the abovementioned claims because when the optical material layer is comprised of more than one material the

Art Unit: 1794

effective index of refraction will be a weighted average based on the molecular composition of the optical material layer. The silicone oil is chosen to be approximately the same as the effective/average refractive index of the optical material layer, which therefore means it will intrinsically be within the minimum and maximum indices of refraction; furthermore, it would have been obvious to one having ordinary skill in the art to vary the individual ratios of all the components in the optical material layer to arrive at an appropriate index of refraction that can be matched by an appropriate index of refraction matching layer.

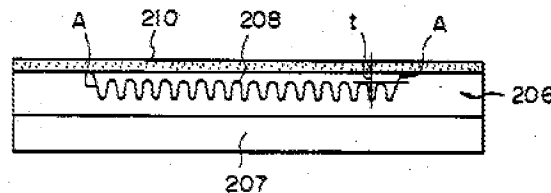
With regard to claim 27, the optical material layer taught by Otaki et al. is comprised of siloxanes [0027].

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinaga et al. (JP 01-231082) in view of Otaki et al. (JP 2002-236439) as evidenced by Travnicek (3,996,187) as applied to claim 1 above, and further in view of Inokuchi et al. (5,064,258).

With regard to claim 3, Yoshinaga et al. in view of Otaki et al. as evidenced by Travnicek teach all of the limitations of applicants' claim 1 in section 13 above; however, they fail to teach a spacer layer that is formed between the substrate and the solid component by curing the outer periphery of the optical material layer, the spacer being formed to have a thickness larger than that of an inner portion of the optical material layer.

Inokuchi et al. teach the holographic device of Figure 22.

Fig. 22



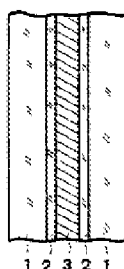
The device is comprised of an optical material layer **206**, which has been UV cured in such a way that the edge regions of the optical material layer are thicker than the inner portions (col. 15, lines 42-69).

Since Yoshinaga et al. in view of Otaki et al. as evidenced by Travnicek and Inokuchi et al. are all drawn to holographic devices, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the spacer of Inokuchi et al. into the device of Yoshinaga et al. in view of Otaki et al. The results of such a combination would have been predictable to one having ordinary skill; further, each of the elements would have performed the same in combination as they had separately. The motivation for doing this combination would be to eliminate the step of applying an additional spacer, which is cumbersome, and also it would be cheaper to provide the spacer of the same material as the optical material layer.

11. Claims 5, 10, 13, 17, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinaga et al. (JP 01-231082) in view of Otaki et al. (JP 2002-236439) and Inokuchi et al. (5,064,258) as evidenced by Travnicek (3,996,187).

With regard to claim 5, Yoshinaga et al. disclose the device of Figure 1.

第 1 図



They disclose an optical component comprised of a holographic film **3**, which is equivalent to applicants' optical material layer, an index of refraction matching fluid **2** covering the holographic film, which may be silicone oil (an organosilicon resin layer), and then a substrate **1** and solid component **1**, which are both glass substrates; however, they do not specifically set forth the materials of the holographic recording layer and they fail to teach a spacer layer that is formed between the substrate and the solid component by curing the outer periphery of the optical material layer, the spacer being formed to have a thickness larger than that of an inner portion of the optical material layer.

Otaki et al. teach a volume holographic recording medium. The recording layer is comprised of an organic-inorganic hybrid polymer of general formula (1), which is formed by hydrolysis polycondensation [0029]. The solution is then applied to a base material film, which is equivalent to applicants' substrate [0059] to [0060], and dried to form the optical material layer [0063].

Since Otaki et al. and Yoshinaga et al. are both drawn to volume type holographic materials; it would have been obvious to one having ordinary skill in the art

Art Unit: 1794

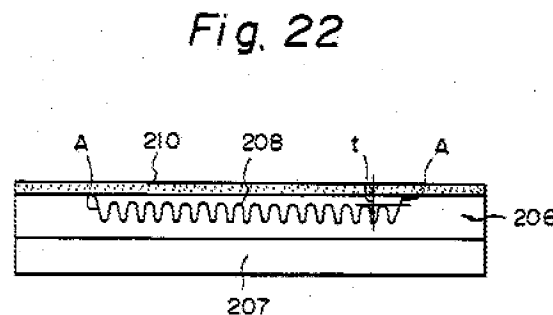
at the time the invention was made to substitute the known holographic recording materials of Otaki et al. as the recording layer **3** of Yoshinaga et al. The results of which would have been completely predictable to one having ordinary skill in the art of holography; furthermore, one of ordinary skill would understand that an index of refraction liquid of silicone oil would be completely appropriate for the inorganic-organic hybrid recording materials of Otaki et al. as they have similar structural characteristics, and would therefore intrinsically have similar indices of refraction. This is further evidenced in Travnicek, which states that various silicone oils are known to have refractive indices of 1.43 to 1.49 (col. 2, line 55 to col. 3, line 9). The motivation for this combination can be seen at [0083] of Otaki et al., where they state that the materials of their invention have good performance with respect to sensibility and transparency, but also have toughness and thermal resistance.

With regard to the limitation that the optical material layer has a “wave-like thickness unevenness and the organosilicon resin layer is coated on the surface of the optical material layer after drying and corrects the wave-like unevenness to optically uniform,” given the fact that Yoshinaga et al. in view of Otaki et al. disclose the same materials that comprise applicants' optical material layer, and also given the fact that the references make the optical material layer in the same manner as applicants (i.e. coating on a substrate followed by drying); the Examiner deems the optical material layer of Yoshinaga et al. in view of Otaki et al. will intrinsically display wave-like unevenness as claimed. Additionally, the fact that index of refraction matching fluid is present is to correct the wave-like unevenness to optically uniform is an intended use

Art Unit: 1794

limitation. Intended use limitations are not dispositive of patentability; however, given the fact that Yoshinaga et al. in view of Otaki et al. disclose an optical material layer and the method of making said optical material layer as claimed, and also given the fact that they disclose an organosilicon resin layer as claimed; it is clear to the Examiner that the organosilicon resin layer will perform applicants' intended use.

Inokuchi et al. teach the holographic device of Figure 22.



The device is comprised of an optical material layer **206**, which has been UV cured in such a way that the edge regions of the optical material layer are thicker than the inner portions (col. 15, lines 42-69).

Since Yoshinaga et al. in view of Otaki et al. as evidenced by Travnicek and Inokuchi et al. are all drawn to holographic devices, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the spacer of Inokuchi et al. into the device of Yoshinaga et al. in view of Otaki et al. The results of such a combination would have been predictable to one having ordinary skill; further, each of the elements would have performed the same in combination as they had separately. The motivation for doing this combination would be to eliminate the

step of applying an additional spacer, which is cumbersome, and also it would be cheaper to provide the spacer of the same material as the optical material layer.

With regard to claims 10, 13, 17, and 26, the silicone oils of Yoshinaga et al. will intrinsically have an index of refraction that is approximately equal to or within 0.05 of the index of refraction of the inorganic-organic hybrid materials, [0046] and Travnicek values. The silicone oils are chosen to be an index of refraction matching layer, and therefore they will intrinsically satisfy the limitations of the abovementioned claims because when the optical material layer is comprised of more than one material the effective index of refraction will be a weighted average based on the molecular composition of the optical material layer. The silicone oil is chosen to be approximately the same as the effective/average refractive index of the optical material layer, which therefore means it will intrinsically be within the minimum and maximum indices of refraction; furthermore, it would have been obvious to one having ordinary skill in the art to vary the individual ratios of all the components in the optical material layer to arrive at an appropriate index of refraction that can be matched by an appropriate index of refraction matching layer.

With regard to claim 28, the optical material layer taught by Otaki et al. is comprised of siloxanes [0027].

Response to Arguments

12. Applicant's arguments, see Remarks, filed 10/27/2008, with respect to the objections to the specification, the objections to the claims, and the rejection of claims

Art Unit: 1794

1-19 and 25-28 under 35 U.S.C. 112, second paragraph have been fully considered and are persuasive. The relevant objections/rejections have been withdrawn.

13. Applicant's arguments filed 10/27/2008 have been fully considered but they are not persuasive.

Applicants are attempting to argue that the new limitations added to claims 1, 4, and 5 define their invention over the prior art.

The new limitations are that "the optical material layer has a wave-like thickness unevenness; and the organosilicon resin layer is coated on the surface of the optical material layer after drying and corrects the wave-like unevenness to optically uniform."

The Examiner respectfully disagrees that the new limitations define the invention over the prior art. Given the fact that Yoshinaga et al. in view of Otaki et al. disclose the same materials that comprise applicants' optical material layer, and also given the fact that the references make the optical material layer in the same manner as applicants (i.e. coating on a substrate followed by drying); the Examiner deems the optical material layer of Yoshinaga et al. in view of Otaki et al. will intrinsically display wave-like unevenness as claimed. Additionally, the fact that index of refraction matching fluid is present is to correct the wave-like unevenness to optically uniform is an intended use limitation. Intended use limitations are not dispositive of patentability; however, given the fact that Yoshinaga et al. in view of Otaki et al. disclose an optical material layer and the method of making said optical material layer as claimed, and also given the fact that

they disclose an organosilicon resin layer as claimed; it is clear to the Examiner that the organosilicon resin layer will perform applicants' intended use.

The organosilicon resin layer is an index of refraction matching fluid. This means the fluid is specifically provided in order to make the article optically uniform as claimed. The organosilicon resin layer will make the article optically uniform by forming around any irregularities in the surface of the optical material layer.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERARD T. HIGGINS whose telephone number is

Art Unit: 1794

(571)270-3467. The examiner can normally be reached on M-F 9:30am-7pm est. (1st Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on 571-272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gerard T Higgins
Examiner
Art Unit 1794

/Gerard T Higgins/
Examiner, Art Unit 1794

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1794